

Explanation of Significant Differences

Kennecott South Zone, Operable Unit 2 Southwest Jordan River Valley Ground Water Plumes

U.S. Environmental Protection Agency, Region 8
Utah Department of Environmental Quality

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Introduction

The Kennecott South Zone Site, proposed for the National Priorities List (NPL) in 1994, is located in southwestern Salt Lake County, Utah, about 10 miles southwest of Salt Lake City. Operable Unit 2 (OU2) of the Site, known as the Southwest Jordan River Valley Ground Water Plumes, encompasses the groundwater beneath all or portions of the municipalities of West Jordan, South Jordan, Riverton, Herriman, and portions of unincorporated Salt Lake County. A Record of Decision, selecting a remedy for OU2, is dated December 13, 2000.

The remedy was modified with an Explanation of Significant Differences (ESD) in August 2003. This December 2006 Explanation of Significant Differences is the second ESD to modify the original remedy. While the overall approach to this Site, and the ability to meet stated objectives, remains unchanged, certain refinements to the original remedy (as modified by the first ESD) are necessary.

This Explanation of Significant Differences (ESD) describes the rationale for modifying the remedy specified in the Record of Decision (ROD) and first ESD for Operable Unit 2 of the Kennecott South Zone Site. Section 117(c) of CERCLA, 42 USC §9617(c), and the National Contingency Plan (NCP), 40 C.F.R. Section 300.435(c)(2)(i) require that an ESD be prepared when the differences in the Remedial Action significantly change but do not fundamentally alter the remedy selected in the ROD with respect to scope, performance, or cost.

This ESD is supported by and will become part of the Administrative Record file for this Site, in accordance with the NCP, Section 300.823(a)(2). The Administrative Record is available for review at UDEQ's office located at 168 North 1950 West, Salt Lake City, Utah. Key documents and reports are also available for review at the City Recorder's Office, City of West Jordan, 8000 South Redwood Rd, West Jordan, UT 84088.

Site History

The Kennecott South Zone Site is composed of historic mining sites, of surface areas contaminated by mining wastes which migrated from source areas downgradient to cities and towns, and of subsurface areas contaminated by acid leachates from the mining district. The Kennecott South Zone Site is comprised of fifteen operable units.

The remedy selected for the Kennecott South Zone Operable Unit No. 2 – Southwest Jordan Valley Groundwater Plumes, involves treatment and containment of contaminated ground water. The principal sources which caused the ground water contamination have been addressed in previous actions or are managed by Kennecott under provisions of a Utah Ground Water Protection Permit.

The selected remedy, as modified by the first ESD, contains the following elements:

- Continuation of source control measures as administered through the State of Utah Ground Water Protection Program.
- Prevent human exposure to unacceptable high concentrations of hazardous substances and/or pollutants or contaminants by limiting access to the contaminated ground water. The State Ground Water Management Plan, issued by the State Engineer in June 2002, addresses issues specific to the remediation effort and needed restrictions in the area of the plumes.
- Prevent human exposure to unacceptable high concentrations of hazardous substances and/or pollutants or contaminant through point-of-use management which includes providing in-house treatment units to residents with impacted wells, replacement of their water by hooking the properties up to municipal drinking and/or secondary supplies, and/or modifying their wells to reach uncontaminated waters.
- Contain the acid plume in Zone A by installation of barrier wells at the leading edge of the contamination (1500 ppm sulfate or less), pump and treat the waters to provide a hydraulic barrier to prevent further plume movement while providing treated water for municipal use. The treatment technology for the barrier well waters is reverse osmosis.
- Withdraw the heavily contaminated waters from the core of the acid plume in Zone A and send it directly to the tailings line. Neutralization and metals removal takes place in the tailings line. Neutralization can be augmented with lime if needed.
- Monitor the plume to follow the progress of natural attenuation for the portions of the Zone A plume which contain sulfate in excess of the primary drinking water standard for sulfate (500 ppm sulfate).
- Disposal of acid water and reverse osmosis concentrates in existing pipeline used to slurry tailings to a tailings impoundment prior to mine closure.
- Development of a post-mine closure plan to manage extracted acid core water and reverse osmosis treatment concentrates (derived from the management option selected for the water extracted at the leading edge wells) for use when the mine and mill are no longer operating.

Basis for and Description of the Significant Differences

A number of clarifications to the remedy are required to address barrier well water management, source control measures for the Eastside Collection System and Bingham Reservoir, and performance standards.

1) Water Management

The December 2000 ROD selected treatment of barrier well water using reverse osmosis and delivery of treated water to a municipal water purveyor. This clarification to the remedy is to allow other management options for barrier well water including continued use by Kennecott for industrial needs or the provision of raw or treated barrier well water for any other lawful use that is both consistent with the quality of the water, previous decision documents and acceptable to EPA and UDEQ.

2) Source Control Measures

The original remedy indicates that source control measures (i.e., Eastside Collection System, Bingham Reservoir) are to be operated under State permits. As a clarification, these permits are considered complimentary to the OU2 remedy and management of the Southwest Jordan Valley Groundwater plumes. UDEQ will provide routine reports to evaluate compliance with State permits. In the event that State permits and/or programs are ineffective in controlling potential sources of contamination to the groundwater plume, additional Federal CERCLA response actions may be required. At a minimum, Kennecott's compliance with applicable State permits will be evaluated no less often than every five years pursuant to the CERCLA requirement to conduct a Five Year Review whenever waste is left in place precluding unrestricted use and unlimited exposure.

3) Performance Standards

There are three performance standards related to the rate of extraction from the core of the plume in Zone A, plume containment, and cleanup levels to demonstrate the effectiveness of the remedy.

A) Extraction Rate

Several wells have been installed for the extraction of heavily contaminated water from the core of the acid plume in Zone A. The change in this ESD is to define a rate of extraction to assure reduction in the size of the contaminated plume. As of the time of the writing of this ESD, that extraction rate has been established at a minimum of 1200 acre-feet per year from the core of the acid plume, on a five-year rolling average. The extraction rate may be modified pursuant to the Operation, Maintenance and Replacement (OM&R) Plan.

B) Containment

Another change from the 2000 ROD is that a series of compliance points has been established along the northern, eastern, and southern boundaries of the Zone A Plume. These points of compliance are identified in the OM&R Plan. The points of compliance may be modified pursuant to the OM&R Plan.

C) Cleanup Levels

The final cleanup levels for active remediation are given in the following table:

FINAL CLEANUP LEVELS FOR ACTIVE REMEDIATION

Contaminant	Cleanup Levels Throughout the Acid Plume (dissolved concentrations)
pH	pH = 6.5 – 8.5
Arsenic	0.05 mg/l
Barium	2 mg/l
Cadmium	0.005 mg/l
Copper	1.3 mg/l
Fluoride	4 mg/l
Lead	0.015 mg/l
Selenium	0.05 mg/l
Nickel	0.1 mg/l
Sulfate*	1500 mg/l

* Once sulfate has reached 1500 mg/l throughout the plume, active remediation may be discontinued in favor of monitored natural attenuation until sulfate concentrations throughout the plume reach 500 mg/l.

Nitrate has been deleted as a contaminant of concern since nitrate concentrations have consistently been well below the groundwater protection limit.

Treatment levels for the reverse osmosis treatment plant have been deleted since the water treatment plant is operating under a permit with the Utah Division of Drinking Water.

The method for determining when final cleanup levels have been met will be identified in the OM&R Plan when the groundwater quality in the plume approaches the final cleanup levels.

Comments from Utah Department of Environmental Quality

The Utah Department of Environmental Quality (UDEQ) supports EPA's decision to modify the remedy for Operable Unit 2 of the Kennecott South Zone Site.

Public Participation

EPA will publish a notice in the Deseret News and Salt Lake Tribune newspapers that describes the ESD and its availability for review (under Section 117(c) of CERCLA, 42 U.S.C. Section 9617). While a formal public comment period is not required when issuing an ESD, EPA and UDEQ welcome comments from the public. Following a 30-day comment period, the agencies will prepare a responsiveness summary to any comments received. This ESD, and all documents that support the changes and clarifications, are contained in the Administrative Record of the Kennecott South Zone Site (under 40 CFR, Section 300.435(c)(2)(i)).

Statutory Determinations

Under CERCLA Section 121, EPA must select a remedy that is protective of human health and the environment, complies with Applicable or Relevant and Appropriate Requirements (ARARs), and is cost effective. EPA believes that the modifications to the ROD for the Southwest Jordan River Valley groundwater plumes are appropriate and the remedy will remain protective of human health and the environment. The selected remedy will continue to comply with federal and state requirements that are applicable and relevant and appropriate to the remedial action. This ESD does not fundamentally change the remedy and is cost effective.

Section 121 also states that EPA must select a remedy that uses permanent solutions, alternative treatment technologies, or resource recovery technologies to the maximum extent practicable. In addition, CERCLA prefers remedies that include treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous waste as a principal element of the remedy. The selected remedy uses treatment as a principal element in remediation of the aquifer and meets the statutory requirement.

Date

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